What is claimed is:

1. A method of inducing a mutation in a gene in a eukaryotic cell, wherein the gene is operably linked to a promoter, and wherein the gene is within about two kilobases of the promoter, the method comprising expressing a transgenic activation-induced cytidine deaminase (AID) gene in the cell.

2. The method of claim 1, wherein the gene is also operably linked to an enhancer.

3. The method of claim 2, wherein the enhancer is an immunoglobulin enhancer.

4. The method of any one of claims 1-3, wherein the gene is between 10 bases and 2 kb in the 3' direction from the promoter.

5. The method of any of claims 1-4, wherein the promoter is an immunoglobulin promoter.

6. The method of any one of claims 1-5, wherein a polyA mRNA of the gene is synthesized in the cell, the polyA mRNA of the gene comprising at least 0.01% of total polyA mRNA in the cell.

7. The method of claim 6, wherein the polyA mRNA of the gene comprises at least 0.1% of total polyA mRNA in the cell.

8. The method of claim 6, wherein the polyA mRNA of the gene comprises at least 0.5% of total polyA mRNA in the cell.

9. The method of claim 6, wherein the polyA mRNA of the gene comprises at least 1% of total polyA mRNA in the cell.

10. The method of any one of claims 1-9, wherein expression of the AID gene is constitutive.

11. The method of any one of claims 1-9, wherein expression of the AID gene is inducible.

12. The method of claim 11, wherein the inducible AID gene expression is under control of a *tet* system or an ecdysone receptor system.

13. The method of any one of claims 1-12, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

14. The method of claim 13, wherein the sequence foreign to the cell is at least 1000 bp long.

15. The method of claim 13, wherein the sequence foreign to the cell is at least 2000 bp long.

16. The method of any one of claims 13-15, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

17. The method of any one of claims 13-16, wherein the sequences foreign to the cell are bacterial sequences.

18. The method of any one of claims 1-17, wherein the cell is a yeast cell.

19. The method of any one of claims 1-17, wherein the cell is a vertebrate cell.

20. The method of claim 19, wherein the cell is a mammalian cell.

21. The method of claim 20, wherein the cell is a B-cell.

22. The method of claim 20, wherein the cell is a hybridoma.

23. The method of any one of claims 20-22, wherein the cell is a human cell.

24. The method of any one of claims 1-23, wherein the gene is an antibody gene.

25. The method of any one of claims 1-23, wherein the gene encodes a protein selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein.

26. The method of any one of claims 1-25, wherein the gene is a transgene.

27. The method of any one of claims 1-25, wherein the gene is a native gene.

28. The method of any one of claims 1-27, wherein the gene is a prokaryotic gene.

29. The method of any one of claims 1-27, wherein the gene is a eukaryotic gene.

30. The method of claim 29, wherein the gene is a plant gene.

31. The method of claim 29, wherein the gene is a vertebrate gene.

32. The method of claim 29, wherein the gene is a mammalian gene.

33. The method of claim 29, wherein the gene is a human gene.

34. A method of determining the effect of mutations in a gene encoding a protein on the phenotype of the protein in a eukaryotic cell, wherein the gene is operably linked to a promoter, and wherein the gene is within about two kilobases of the promoter, the method comprising

(a) expressing the protein and a transgenic AID gene in the eukaryotic cell;

(b) establishing clonal colonies of the cell;

(c) identifying clonal colonies that produce a gene of the protein that has a mutation;

(d) determining whether the protein expressed by the mutated gene in any clonal colony identified in step (c) has an altered phenotype; and

(e) associating the altered phenotype with a particular mutation.

35. The method of claim 34, wherein the gene is also operably linked to an enhancer.

36. The method of claim 35, wherein the enhancer is an immunoglobulin enhancer.

37. The method of any one of claims 34-36, wherein AID gene expression is inducible in the cell and AID gene expression is induced only during step (a).

38. The method of claim 37, wherein the inducible AID gene expression is under control of a *tet* system or an ecdysone receptor system.

39. The method of any one of claims 34-38, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

40. The method of claim 39, wherein the sequence foreign to the cell is at least 1000 bp long.

41. The method of claim 39, wherein the sequence foreign to the cell is at least 2000 bp long.

42. The method of any one of claims 39-41, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

43. The method of any one of claims 39-42, wherein the sequences foreign to the cell are bacterial sequences.

44. The method of any one of claims 35-43, wherein the promoter is an immunoglobulin promoter and the enhancer is an immunoglobulin enhancer.

45. The method of any one of claims 34-44, wherein the altered phenotype of the protein causes an alteration in a phenotype of the cell.

46. The method of any one of claims 34-45, wherein the cell is a yeast cell.

47. The method of any one of claims 34-45, wherein the cell is a vertebrate cell.

48. The method of claim 47, wherein the cell is a mammalian cell.

49. The method of claims 48, wherein the cell is a B-cell.

50. The method of claim 49, wherein the cell is a hybridoma.

51. The method of any one of claims 48-50, wherein the cell is a human cell.

52. The method of any one of claims 34-51, wherein the gene is an antibody gene.

53. The method of any one of claims 34-51, wherein the gene encodes a protein selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein.

54. The method of any one of claims 34-53, wherein the gene is a transgene.

55. The method of any one of claims 34-53, wherein the gene is a native gene.

56. The method of any one of claims 34-54, wherein the gene is a prokaryotic gene.

57. The method of any one of claims 34-54, wherein the gene is a eukaryotic gene.

58. A method of inducing a mutation in an antibody gene in a eukaryotic cell, the method comprising expressing a transgenic AID gene in the cell.

59. The method of claim 58, wherein the antibody gene encodes at least a portion of an antibody that binds to an antigen.

60. The method of claim 58 or 59, wherein expression of the AID gene is constitutive.

61. The method of claim 58 or 59, wherein expression of the AID gene is inducible.

62. The method of claim 61, wherein the inducible AID gene expression is under control of a *tet* system or an ecdysone receptor system.

63. The method of any one of claims 58-62, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

64. The method of claim 63, wherein the sequence foreign to the cell is at least 1000 bp long.

65. The method of claim 63, wherein the sequence foreign to the cell is at least 2000 bp long.

66. The method of any one of claims 63-65, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

67. The method of any one of claims 63-66, wherein the sequences foreign to the cell are bacterial sequences.

68. The method of any one of claims 58-67, wherein the cell is a yeast cell.

69. The method of any one of claims 58-67, wherein the cell is a vertebrate cell.

70. The method of claim 69, wherein the cell is a mammalian cell.

71. The method of claim 70, wherein the cell is a hybridoma.

72. The method of any one of claims 58-71, wherein the antibody is selected from the group consisting of a human or humanized antibody, a mouse antibody, a rabbit antibody, and a hamster antibody.

73. The method of claim 72, wherein the antibody is a mouse antibody.

74. The method of claim 72, wherein the antibody is a human or humanized antibody.

75. The method of any one of claims 59-74, wherein the mutated antibody gene encodes at least a portion of an antibody that has higher affinity for the antigen than the antibody before the mutation.

76. The method of any one of claims 59-74, wherein the mutated antibody gene encodes at least a portion of an antibody that has lower affinity for the antigen than the antibody before the mutation.

77. The method of any one of claims 59-76, wherein the mutated antibody gene encodes at least a portion of an antibody that has higher specificity for the antigen than the antibody before the mutation.

78. The method of any one of claims 59-76, wherein the mutated antibody gene encodes at least a portion of an antibody that has lower specificity for the antigen than the antibody before the mutation.

79. The method of any one of claims 59-78, wherein the mutated antibody gene encodes at least a portion of an antibody that has altered cross-reactivity for a second antigen than the antibody before the mutation.

80. The method of claim 79, wherein the mutated antibody gene encodes at least a portion of an antibody that has increased cross-reactivity for the second antigen than the antibody before the mutation.

81. The method of claim 79, wherein the mutated antibody gene encodes at least a portion of an antibody that has decreased cross-reactivity for the second antigen than the antibody before the mutation.

82. The method of any one of claims 59-81, wherein the mutated antibody gene is a light chain gene.

83. The method of any one of claims 59-81, wherein the mutated antibody gene is a heavy chain gene.

84. The method of any one of claims 59-81, wherein both the heavy chain gene and the light chain gene are mutated.

85. The method of any one of claims 59-81, wherein the antibody gene encodes at least a portion of an antibody that catalyzes a chemical reaction.

86. The method of any one of claims 59-81, wherein the antigen is a pathogen.

87. The method of claim 86, wherein the pathogen is an animal pathogen.

88. The method of claim 87, wherein the pathogen is a human pathogen.

89. The method of any one of claims 86-88, wherein the pathogen is a virus.

90. The method of any one of claims 86-88, wherein the pathogen is a bacterium.

91. The method of any one of claims 58-81, wherein the antigen is a toxin.

92. The method of claim 91, wherein the toxin is produced by a microorganism.

93. The method of claim 91, wherein the toxin is a polypeptide.

94. The method of claim 91, wherein the toxin is ricin.

95. The method of any one of claims 58-92, wherein the antigen is a hapten.

96. The method of any one of claims 58-92, wherein the antigen is selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein

97. A method of inducing a class switch in an antibody heavy chain gene in a eukaryotic cell, the method comprising expressing a transgenic AID gene in the cell.

98. The method of claim 97, wherein the antibody heavy chain gene encodes a portion of an antibody that binds to an antigen.

99. The method of claim 97 or 98, wherein expression of the AID gene is inducible.

100. The method of claim 99, wherein the inducible AID gene expression is under control of a *tet* system or an ecdysone receptor system.

101. The method of any one of claims 97-100, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

102. The method of claim 101, wherein the sequence foreign to the cell is at least 1000 bp long.

103. The method of claim 101, wherein the sequence foreign to the cell is at least 2000 bp long.

104. The method of any one of claims 101-103, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

105. The method of any one of claims 101-104, wherein the sequences foreign to the cell are bacterial sequences.

106. The method of any one of claims 97-105, wherein the cell is a yeast cell.

107. The method of any one of claims 97-105, wherein the cell is a vertebrate cell.

108. The method of claim 107, wherein the cell is a mammalian cell.

109. The method of claim 108, wherein the cell is a hybridoma.

110. The method of any one of claims 97-109, wherein the antibody is selected from the group consisting of a human or humanized antibody, a mouse antibody, a rabbit antibody, and a hamster antibody.

111. The method of claim 110, wherein the antibody is a mouse antibody.

112. The method of claim 110, wherein the antibody is a human or humanized antibody.

113. The method of any one of claim 97-112, wherein the antibody gene encodes at least a portion of an antibody that catalyzes a chemical reaction.

114. The method of any one of claims 98-112, wherein the antigen is a pathogen.

115. The method of claim 114, wherein the pathogen is an animal pathogen.

116. The method of claim 115, wherein the pathogen is a human pathogen.

117. The method of any one of claims 114-116, wherein the pathogen is a virus.

118. The method of any one of claims 114-116, wherein the pathogen is a bacterium.

119. The method of any one of claims 98-112, wherein the antigen is a toxin.

120. The method of claim 119, wherein the toxin is produced by a microorganism.

121. The method of claim 119, wherein the toxin is a polypeptide.

122. The method of claim 119, wherein the toxin is ricin.

123. The method of any one of claims 98-120, wherein the antigen is a hapten.

124. The method of any one of claims 98-120, wherein the antigen is selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein.

125. A method of altering an affinity or a specificity of a monoclonal antibody to an antigen, or altering a cross-reactivity of the monoclonal antibody to a second antigen, wherein the monoclonal antibody is produced by a eukaryotic cell, and wherein the cell is capable of expressing a transgenic AID gene under inducible control, the method comprising

(a) expressing the AID gene in the eukaryotic cell for a time and under conditions sufficient to induce a mutation in a gene encoding the monoclonal antibody;

(b) suppressing expression of AID gene in the eukaryotic cell;

(c) establishing clonal colonies of the cell; and

(d) determining whether the monoclonal antibody produced by any of the clonal colonies of the cell has altered affinity or specificity to the antigen, or altered cross-reactivity to the second antigen.

126. The method of claim 125, wherein steps (a) through (d) are repeated with a clonal colony that has altered affinity or specificity to the antigen, or altered cross-reactivity to the second antigen.

127. The method of claim 125 or 126, wherein the inducible AID gene expression is under control of a *tet* system or ecdysone receptor system.

128. The method of any one of claims 125-127, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

129. The method of claim 128, wherein the sequence foreign to the cell is at least 1000 bp long.

130. The method of claim 128, wherein the sequence foreign to the cell is at least 2000 bp long.

131. The method of any one of claims 128-130, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

132. The method of any one of claims 128-131, wherein the sequences foreign to the cell are bacterial sequences.

133. The method of any one of claims 125-132, wherein the cell is a yeast cell.

134. The method of any one of claims 125-132, wherein the cell is a vertebrate cell.

135. The method of claim 134, wherein the cell is a mammalian cell.

136. The method of claim 135, wherein the cell is a hybridoma.

137. The method of any one of claims 125-136, wherein the antibody is selected from the group consisting of a human or humanized antibody, a mouse antibody, a rabbit antibody, and a hamster antibody.

138. The method of claim 137, wherein the antibody is a mouse antibody.

139. The method of claim 137, wherein the antibody is a human or humanized antibody.

140. The method of any one of claims 125-139, wherein the mutated antibody gene encodes at least a portion of an antibody that has higher affinity for the antigen than the antibody before the mutation.

141. The method of any one of claims 125-139, wherein the mutated antibody gene encodes at least a portion of an antibody that has lower affinity for the antigen than the antibody before the mutation.

142. The method of any one of claims 125-141, wherein the mutated antibody gene encodes at least a portion of an antibody that has higher specificity for the antigen than the antibody before the mutation.

143. The method of any one of claims 125-141, wherein the mutated antibody gene encodes at least a portion of an antibody that has lower specificity for the antigen than the antibody before the mutation.

144. The method of any one of claims 125-143, wherein the mutated antibody gene encodes at least a portion of an antibody that has altered cross-reactivity for a second antigen than the antibody before the mutation.

145. The method of claim 144, wherein the mutated antibody gene encodes at least a portion of an antibody that has increased cross-reactivity for the second antigen than the antibody before the mutation.

146. The method of claim 144, wherein the mutated antibody gene encodes at least a portion of an antibody that has decreased cross-reactivity for the second antigen than the antibody before the mutation.

147. The method of any one of claims 125-146, wherein the antibody gene encodes at least a portion of an antibody that catalyzes a chemical reaction.

148. The method of any one of claims 125-146, wherein the antigen is a pathogen.

149. The method of claim 148, wherein the pathogen is an animal pathogen.

150. The method of claim 149, wherein the pathogen is a human pathogen.

151. The method of any one of claims 148-150, wherein the pathogen is a virus.

152. The method of any one of claims 148-150, wherein the pathogen is a bacterium.

153. The method of any one of claims 125-146, wherein the antigen is a toxin.

154. The method of claim 153, wherein the toxin is produced by a microorganism.

155. The method of claim 153, wherein the toxin is a polypeptide.

156. The method of claim 153, wherein the toxin is ricin.

157. The method of any one of claims 125-154, wherein the antigen is a hapten.

158. The method of any one of claims 125-154, wherein the antigen is selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein.

159. A eukaryotic cell comprising a transgenic AID gene, wherein expression of the AID gene is inducible.

160. The cell of claim 159, wherein the inducible AID expression is under control of a *tet* system or an ecdysone receptor system.

161. The cell of claim 159 or 161, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

162. The cell of claim 161, wherein the sequence foreign to the cell is at least 1000 bp long.

163. The cell of claim 161, wherein the sequence foreign to the cell is at least 2000 bp long.

164. The cell of any one of claims 161-163, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

165. The cell of any one of claims 161-164, wherein the sequences foreign to the cell are bacterial sequences.

166. The cell of any one of claims 159-165, wherein the cell is a yeast cell.

167. The cell of any one of claims 159-165, wherein the cell is a vertebrate cell.

168. The cell of claim 167, wherein the cell is a mammalian cell.

169. The cell of claim 168, wherein the cell is a human cell.

170. The cell of claim 168, wherein the cell is a CHO cell.

171. The cell of any one of claims 167-169, wherein the cell is a T cell.

172. The cell of any one of claims 167-169, wherein the cell is a myeloma cell.

173. The cell of any one of claims 167-169, wherein the cell is a hybridoma cell.

174. The cell of any one of claims 159-173, further comprising a gene encoding a protein, wherein the gene is operably linked to a promoter, and wherein the gene is within about two kilobases of the promoter.

175. The method of claim 174, wherein the gene is also operably linked to an enhancer.

176. The method of claim 175, wherein the enhancer is an immunoglobulin enhancer.

177. The cell of claim 174, wherein the gene undergoes mutation upon expression of the AID gene.

178. The cell of any one of claims 159-177, wherein the cell expresses an antibody gene.

179. The cell of claim 178, wherein expression of the AID gene causes the antibody gene to undergo mutation.

180. A eukaryotic cell expressing an AID gene, wherein the cell is not a B-cell.

181. The cell of claim 180, wherein the AID gene is a native gene.

182. The cell of claim 180, wherein the AID gene is a transgene.

183. The cell of any one of claims 180-182, wherein the expression of the AID gene is constitutive.

184. The cell of any one of claims 180-182, wherein the expression of the AID gene is inducible.

185. The cell of claim 184, wherein the inducible AID expression is under control of a *tet* system or an ecdysone receptor system.

186. The cell of any one of claims 180-185, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

187. The cell of claim 186, wherein the sequence foreign to the cell is at least 1000 bp long.

188. The cell of claim 186, wherein the sequence foreign to the cell is at least 2000 bp long.

189. The cell of any one of claims 186-188, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

190. The cell of any one of claims 186-189, wherein the sequences foreign to the cell are bacterial sequences.

191. The cell of any one of claims 180-190, wherein the cell is a yeast cell.

192. The cell of any one of claims 180-190, wherein the cell is a vertebrate cell.

193. The cell of claim 192, wherein the cell is a mammalian cell.

194. The cell of claim 193, wherein the cell is a human cell.

195. The cell of claim 193, wherein the cell is a CHO cell.

196. The cell of any one of claims 192-194, wherein the cell is a T cell.

197. The cell of any one of claims 180-196, further comprising a gene operably linked to a promoter, wherein the gene is within about two kilobases of the promoter.

198. The cell of claim 197, wherein the gene is also operably linked to an enhancer.

199. The cell of claim 198, wherein the enhancer is an immunoglobulin enhancer.

200. The cell of any one of claims 197-199, wherein the gene undergoes mutation upon expression of the AID gene.

201. The cell of any one of claims 180-200, wherein the cell expresses an antibody gene.

202. The cell of claim 201, wherein expression of the AID gene causes the antibody gene to undergo mutation.

203. A myeloma fusion partner expressing an AID gene.

204. The myeloma fusion partner of claim 203, wherein the AID gene is transgenic.

205. The myeloma fusion partner of claim 203 or 204, wherein expression of the AID gene is constitutive.

206. The myeloma fusion partner of claim 203 or 204, wherein expression of the AID gene is inducible.

207. The myeloma fusion partner of claim 206, wherein the inducible AID expression is under control of a *tet* system or ecdysone receptor system.

208. The myeloma fusion partner of any one of claims 203-207, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

209. The myeloma fusion partner of claim 208, wherein the sequence foreign to the cell is at least 1000 bp long.

210. The myeloma fusion partner of claim 208, wherein the sequence foreign to the cell is at least 2000 bp long.

211. The myeloma fusion partner of any one of claims 208-210, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

212. The myeloma fusion partner of any one of claims 208-211, wherein the sequences foreign to the cell are bacterial sequences.

213. The myeloma fusion partner of any one of claims 203-212, wherein the fusion partner is selected from the group consisting of a Sp2/0-Ag 14, a FOX-NY, a P3X63, NX-1, a P3, a P3X643 Ag8.653, a NS1, and a NSO.

214. A hybridoma expressing an AID gene.

215. The hybridoma of claim 214, wherein the AID gene is transgenic.

216. The hybridoma of claim 214, wherein expression of the AID gene is constitutive.

217. The hybridoma of claim 214, wherein expression of the AID gene is inducible.

218. The hybridoma of claim 217, wherein the inducible AID gene expression is under control of a *tet* system or an ecdysone receptor system.

219. The hybridoma of any one of claims 214-218, wherein the AID gene is flanked by a sequence foreign to the cell, wherein the sequence foreign to the cell is at least 200 bp long.

220. The hybridoma of claim 219, wherein the sequence foreign to the cell is at least 1000 bp long.

221. The hybridoma of claim 219, wherein the sequence foreign to the cell is at least 2000 bp long.

222. The hybridoma of any one of claims 219-221, wherein a sequence foreign to the cell flanks both the 5' and the 3' end of the AID gene.

223. The hybridoma of any one of claims 219-221, wherein the sequences foreign to the cell are bacterial sequences.

224. The hybridoma of any one of claims 219-222, wherein the hybridoma expresses an antibody that binds to an antigen.

225. The hybridoma of claim 224, wherein an antibody gene undergoes mutation upon expression of the AID gene to cause a mutation in the antibody.

226. The hybridoma of claim 224 or 225, wherein the antibody is selected from the group consisting of a human or humanized antibody, a mouse antibody, a rabbit antibody, and a hamster antibody.

227. The hybridoma of claim 226, wherein the antibody is a mouse antibody.

228. The hybridoma of claim 226, wherein the antibody is a human or humanized antibody.

229. The hybridoma of any one of claims 225-228, wherein the mutated antibody has higher affinity for the antigen than the antibody before the mutation.

230. The hybridoma of any one of claims 225-228, wherein the mutated antibody has lower affinity for the antigen than the antibody before the mutation.

231. The hybridoma of any one of claims 225-230, wherein the mutated antibody has higher specificity for the antigen than the antibody before the mutation.

232. The hybridoma of any one of claims 225-230, wherein the mutated antibody has lower specificity for the antigen than the antibody before the mutation.

233. The hybridoma of any one of claims 225-232, wherein the mutated antibody has altered cross-reactivity for a second antigen than the antibody before the mutation.

234. The hybridoma of any one of claims 214-228, wherein the hybridoma produces an antibody that has undergone a class switch during expression of the AID in the hybridoma.

235. The hybridoma of claim 234, wherein the antibody also has undergone a mutation during expression of the AID in the hybridoma.

236. The hybridoma of any one of claims 214-235, wherein the antibody catalyzes a chemical reaction.

237. The hybridoma of any one of claims 214-235, wherein the antigen is a pathogen.

238. The hybridoma of claim 237, wherein the pathogen is an animal pathogen.

239. The hybridoma of claim 238, wherein the pathogen is a human pathogen.

240. The hybridoma of any one of claims 237-239, wherein the pathogen is a virus.

241. The hybridoma of any one of claims 237-239, wherein the pathogen is a bacterium.

242. The hybridoma of any one of claims 214-236, wherein the antigen is a toxin.

243. The hybridoma of claim 242, wherein the toxin is produced by a microorganism.

244. The hybridoma of claim 242, wherein the toxin is a polypeptide.

245. The hybridoma of claim 242, wherein the toxin is ricin.

246. The hybridoma of any one of claims 214-243, wherein the antigen is a hapten.

247. The hybridoma of any one of claims 214-243, wherein the antigen is selected from the group consisting of an enzyme, a transcription factor, a cytokine, and a structural protein.

248. The hybridoma of any one of claims 214-247, wherein the hybridoma is produced by transfecting a precursor hybridoma with a vector encoding an AID gene.

249. The hybridoma of any one of claims 214-247, wherein the hybridoma is produced by fusing a B-cell with a myeloma cell comprising a transgenic AID gene.

250. A vector capable of transfecting a eukaryotic cell to create the cell of any one of claims 159-202.

251. A mutated gene produced by the method of any one of claims 1-33.

252. A mutated protein encoded by the mutated gene of claim 251.

253. A mutated antibody gene produced by the method of any one of claims 58-96.

254. A mutated antibody comprising the protein encoded by the antibody gene of claim 253.

255. A mutated monoclonal antibody prepared by the method of any one of claims 125-158.

256. A mutated antibody gene encoding at least a portion of the mutated monoclonal antibody of claim 255.

257. A eukaryotic cell comprising the mutated antibody gene of claim 256.

258. A mutated monoclonal antibody produced by the hybridoma of any one of claims 225-249.

259. A mutated antibody gene encoding at least a portion of the mutated monoclonal antibody of claim 258.

260. A eukaryotic cell comprising the mutated antibody gene of claim 259.

261. A hybridoma produced using the fusion partner of any one of claims 203-213.